SITE ASSESSMENT REPORT
FOR
MARKHAM DUMP
MARKHAM, COOK COUNTY, ILLINOIS

NPL STATUS: NON-NPL

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Emergency Response Branch
Region V
77 West Jackson Boulevard
Chicago, IL 60604-3507

Prepared by:

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Reviewed and
Approved by: _____ Date: July 19, 2010
Lisa Graczyk
WESTON START Project Manager

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LIST OF ABBREVIATIONS AND ACRONYMS

ACM	Asbestos-containing material
CFR	*Code of Federal Regulations*
GPS	Global positioning system
IEPA	Illinois Environmental Protection Agency
LD_{50}	Medial lethal dose
mg/kg	Milligram per kilogram
mg/L	Milligram per liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OSC	On-Scene Coordinator
PCB	Polychlorinated biphenyl
PLM	Polarized light microscopy
poly	Polyethylene
RCRA	Resource Conservation and Recovery Act
RSL	Regional Screening Level
START	Superfund Technical Assessment and Response Team
SU	Standard unit
SVOC	Semivolatile organic compound
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
TDD	Technical Direction Document
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile organic compound
WESTON	Weston Solutions, Inc.
XRF	X-ray fluorescence

1. INTRODUCTION

The United States Environmental Protection Agency (U.S. EPA) tasked the Weston Solutions, Inc. (WESTON®), Superfund Technical Assessment and Response Team (START) to assist U.S. EPA in performing a site assessment at Markham Dump in Markham, Cook County, Illinois (the Site). Under Technical Direction Document (TDD) No. S05-0001-1004-040, U.S. EPA requested that WESTON START document current Site conditions; collect soil, liquid, waste, and bulk samples; obtain photographic documentation; and evaluate the potential for imminent and substantial threats to human health, human welfare, and the environment posed by Site conditions. On May 10, 2010, WESTON START conducted a site assessment under the direction of U.S. EPA On-Scene Coordinator (OSC) Steve Faryan.

This site assessment report is organized into the following sections:

- **Introduction** – Provides a brief description of the objective and scope of site assessment activities;
- **Site Background** – Details the Site description and its known history;
- **Site Assessment Activities** – Discusses the methods and procedures used during the site assessment;
- **Analytical Results** – Discusses analytical results for samples collected during the site assessment;
- **Threats to Human Health and the Environment** – Identifies Site conditions that may warrant a removal action under the National Oil and Hazardous Substances Pollution Contingency Plan (NCP); and
- **Conclusions**– Presents conclusions drawn based on the site assessment findings.

Tables and figures are presented after the conclusions section. In addition, this site assessment report contains two appendices: Appendix A provides a photographic log of Site conditions at the time of the site assessment and site assessment activities, and Appendix B provides the laboratory analytical and data validation reports for samples collected during the site assessment.

2. SITE BACKGROUND

This section discusses the site description and site history.

2.1 SITE DESCRIPTION

The Site is located at W. 160th Street and Oakley Avenue in Markham, Cook County, Illinois (Figure 1-1). The approximate meridian coordinates for the Site are latitude 41°35'48.59" North and longitude 87°40'22.16" West. The Site is located in a mixed industrial, commercial, and residential area and is approximately 30 acres in size. The site is approximately bounded by the Calumet Union Ditch (a drainage ditch) to the south, Hamilton Avenue to the east, Western Avenue to the west, and W. 160th Street to the north. A church and residential property (located across 161st Street from the church) are located within the approximate Site boundary.

The Site contains a burn area where a fire occurred; areas containing super sacks, totes, drums, miscellaneous small containers, and gas cylinders (many with unknown contents and some appearing to contain pool chemicals, detergents, oils, and white powders); tires; construction and demolition debris; and abandoned trailers and boats. The Calumet Union Ditch located on the south side of the Site flows east. Residences are located just west of the Site. Figure 1-2 shows an aerial photograph of the Site features.

2.2 SITE HISTORY

The Site has been used to dispose of waste and debris for over 50 years. The Markham Fire Department extinguished a large tire fire at the Site in late March or early April 2010. The City of Markham owns most of the Site property through a tax sale.

In early April 2010, the Illinois Environmental Protection Agency (IEPA) conducted a preliminary inspection of the site. During the week of April 19, 2010, the IEPA conducted private well location surveys; sampled a few private wells in the area; conducted x-ray fluorescence (XRF) screening of on-site soils; collected miscellaneous grab samples; and collected a sample from one of the on-site totes. The private well samples were analyzed for volatile organic compounds (VOC), semivolatile

organic compounds (SVOC), metals, and cyanide. Preliminary results for the private well samples indicated no detections of VOCs, SVOCs or cyanide. Metals results indicate copper concentrations as high as 0.16 milligram per liter (mg/L) and zinc concentrations as high as 0.0302 mg/L. On April 28, 2010, Craig Thomas, U.S. EPA OSC, visited the Site and observed all the Site features discussed above and took photographs.

3. SITE ASSESSMENT ACTIVITIES

This section discusses the site reconnaissance and observations and sampling activities.

3.1 SITE RECONNAISSANCE AND OBSERVATIONS

On May 10, 2010, U.S. EPA OSC Steve Faryan and WESTON START mobilized to the Site to conduct a site assessment.

During the initial site reconnaissance, WESTON START conducted air monitoring in the breathing zone using a MultiRAE five-gas meter and MicroR gamma radiation detector. The MultiRAE five-gas monitor includes a photoionization detector that measures for organic vapors, a carbon monoxide sensor, a hydrogen sulfide sensor, a lower explosive limit meter, and an oxygen meter. The MultiRAE five-gas monitor and MicroR did not indicate any readings above background levels.

The site reconnaissance began on Leavitt Avenue, which contained the most containers, and ended on Claremont Avenue. Observations made during the site reconnaissance are summarized below. Figure 1-2 shows the main areas of concern, and the photographic log in Appendix A depicts Site conditions at the time of the site reconnaissance.

- As a result of the tire fire in late March or early April 2010, the City of Markham had blocked off streets leading to the Site with concrete barricades. Other than these barricades to prevent vehicles from entering the Site, Site access is not restricted. Police do patrol the area around the Site.
- The Site area is somewhat wooded.
- A church is located on W. 161st Street.
- A large burn area is located in the southwest portion of the Site (see Figure 1-2). An empty tank and some gas cylinders also were observed in the southwest corner of the Site. In

addition, insulation-type material was noted scattered about this area.

- Some dogs live on the Site property. Dog food and water dishes were observed on Leavitt Avenue.
- An area near Leavitt Avenue contained the most containers. Most containers were empty. Some drums were open to the atmosphere or tipped over. One area appeared to contain swimming pool chemicals and empty pool chemical containers (see Figure 1-2). Immediately adjacent to the pool chemicals were puddles from recent rain events. Puddles were tested with pH paper and found to have a pH of 11 standard units (SU).
- The following potentially hazardous materials and containers were observed at the Site:
  - White solid material lying on the ground and in 55-gallon polyethylene (poly) drums
  - 2,000-pound super sacks labeled "Sodium Tripoly Phosphate" (online research indicates this to be a cleaning agent used in detergents and soaps)
  - 300-gallon totes partially filled with oil
  - Several 50-pound bags labeled "Ammonium Sulfate"
  - One partially filled (one-quarter full) drum of "Pyrazol Yellow BG Powder" (based on on-line research, a colorant for detergents)
  - Several gas cylinders suspected to be empty
  - Thousands of empty containers, including poly, steel, and fiberboard 55-gallon drums; 5-gallon poly containers; and miscellaneous small (1 quart or less) plastic containers
- U.S. EPA OSC Steve Faryan conducted XRF screening of on-site soils in the burn area, primarily to determine if lead concentrations exceed U.S. EPA cleanup standards. Although several metals were detected in the on-site soils, concentrations that would trigger an emergency cleanup were not observed.

3.2 SAMPLING ACTIVITIES

WESTON START collected a total of four waste samples from containers, four soil samples, two bulk insulation samples, and one surface water sample. Figure 3-1 shows the sampling locations. All sampling locations were recorded using a global positioning system (GPS) device. Attachment A contains photographs of the samples collected. All sampling information was recorded in the Site logbook and on the chain-of-custody forms. All samples were submitted under chain of custody to STAT Analysis Corporation, Chicago, Illinois. The sampling activities are described below.

3.2.1 Waste Samples

WESTON START collected four waste samples (samples MD-C01-051010 through MD-C04-

051010). Figure 3-1 shows the sampling locations. Sample MD-C01-051010 was collected from an open 55-gallon poly drum containing a white solid. This solid material was believed to be a pool chemical and was submitted for chlorine and pH analyses. Sample MD-C02-051010 was collected from a bag labeled "Ammonium Sulfate" and consisted of a white solid material. This sample was submitted for ammonia and pH analyses. Samples MD-C01-051010 and MD-C02-051010 were each collected by donning fresh sampling gloves and scooping the material up with gloved hands and placing the material into the appropriate sample jars.

Sample MD-C03-051010 was an oily liquid collected from a 300-gallon poly-tote. This sample was collected using a plastic drum thief and was submitted for flashpoint (ignitability), polychlorinated biphenyl (PCB), and VOC analyses. Sample MD-C04-051010 was a yellow semi-solid collected from a 55-gallon poly drum labeled "Pyrazol Yellow BG Powder." This sample was collected using a plastic sampling scoop and submitted for cyanide, pH, and Target Analyte List (TAL) metals analyses.

3.2.2 Soil Samples

WESTON START collected four soil samples (samples MD-S01-051010 through MD-S04-051010). Figure 3-1 shows the sampling locations. Sample MD-S01-051010 was collected in an area of stained soil near the oil-containing totes. Samples MD-S02-051010 through MD-S04-051010 were collected from the burn area. The soil samples were collected as grab samples either using plastic sampling scoops or gloved hands. Fresh sampling gloves were donned at each sampling location. Sample MD-S01-051010 was submitted for total Resource Conservation and Recovery Act (RCRA) metals, PCB, VOC, and SVOC analyses. Samples MD-S02-051010 through MD-S04-051010 were submitted for total RCRA metals and Toxicity Characteristic Leaching Procedure (TCLP) metals analyses.

3.2.3 Bulk Samples

WESTON START collected two bulk insulation solid samples of suspected asbestos-containing material (ACM) (samples MD-BULK01-051010 and MD-BULK02-051010). Figure 3-1 shows the sampling locations. These samples were collected from the burn area by donning fresh sampling

gloves, breaking off some of the insulation material with gloved hands, and placing each sample into the appropriate sample jar. Samples MD-BULK01-051010 and MD-BULK02-051010 were submitted for asbestos analysis by polarized light microscopy (PLM).

3.2.4 Surface Water Sample

WESTON START collected one surface water composite sample (sample MD-W01-051010). Figure 3-1 shows the sampling location. This surface water sample was a composite of water from puddles located next to the pool chemicals. One of the puddles used for the composite sample indicated a pH of 11 SUs during the site reconnaissance. This sample was collected by using clean sampling jars to retrieve puddled water. Sample MD-W01-051010 was submitted for chloride, chlorine, ammonia, and pH analyses.

4. ANALYTICAL RESULTS

A total of four waste samples, four soil samples, two bulk samples, and one surface water sample were collected from the Site to determine if the Site poses an imminent and substantial threat to human health, human welfare, or the environment. This section discusses the analytical results for the waste, soil, bulk, and surface water samples. Appendix B provides the laboratory analytical and data validation reports for the sample results. Analytical results for the general chemistry parameters and TCLP metals were compared to the hazardous waste criteria outlined in Title 40 of the Code of Federal Regulations (CFR), Part 261, Subpart C. Soil sample analytical results were compared to the U.S. EPA Industrial and Residential Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites.

4.1 WASTE SAMPLE ANALYTICAL RESULTS

Table 4-1 summarizes the waste sample analytical results for general chemistry parameters (ammonia as nitrogen, chlorine, ignitability, cyanide, and pH), TAL metals, PCBs, and VOCs.

Sample MD-C01-051010 was a white solid suspected to be a type of pool chemical analyzed for chlorine and corrosivity (pH). Sample MD-C01-051010 contained 4.5 percent chlorine had a pH of 9.4 SUs.

Sample MD-C02-051010 was a white solid collected from a bag labeled "Ammonium Sulfate" and analyzed for ammonia and pH. This sample contained 2,800 milligrams per kilogram (mg/kg) of ammonia and had a pH of 5.6 SUs.

Sample MD-C03-051010 was an oily liquid collected from a 300-gallon tote and analyzed for ignitability, PCBs, and VOCs. This sample was not ignitable and did not contain PCBs at detectable concentrations. The sample contained some VOCs at low detectable concentrations as follows: 2-hexanone at 1.4 mg/kg, acetone at 6.1 mg/kg, and chloroform at 8.1 mg/kg.

Sample MD-C04-051010 C03 was a yellow semi-solid from a drum labeled "Pyrazol Yellow BG Powder" and analyzed for cyanide, pH, and TAL metals. The sample did not contain cyanide at a detectable concentration and had a pH of 12 SUs, which is just less than the RCRA limit for corrosive hazardous waste of 12.5 SUs. The sample contained several metals at detectable concentrations as follows: aluminum at 74 mg/kg; barium at 2.1 mg/kg; copper at 5.2 mg/kg; iron at 170 mg/kg; manganese at 1.2 mg/kg; potassium at 73 mg/kg; and sodium at 270,000 mg/kg.

4.2 SOIL SAMPLE ANALYTICAL RESULTS

Table 4-2 summarizes the soil sample analytical results for total metals, TCLP metals, PCBs, VOCs, and SVOCs. Sample MD-S01-051010 was analyzed for total metals, TCLP metals, PCBs, VOCs, and SVOCs. Samples MD-S02-051010 through MD-S04-051010 were analyzed for total metals and TCLP metals. Significant results are summarized below.

- **Total Metals:** Total metal results were compared to the U.S. EPA Industrial and Residential RSLs. Results for all four samples exceeded the Residential RSL for arsenic. Results for samples MD-S02-051010 through MD-S04-051010 also exceeded the Industrial RSL for arsenic. In addition, the lead result for sample MD-S04-051010 exceeded both the residential and industrial RSLs.
- **TCLP Metals:** None of the TCLP metals results exceeded the characteristic for toxicity as stated in 40 CFR 261.24.
- **PCBs:** PCBs were not detected in sample MD-S01-051010.
- **VOCs:** The only VOC detected in soil sample MD-S01-051010 was chloroform at 0.44 mg/kg. This result exceeds the U.S. EPA Residential RSL for chloroform.

- **SVOCs:** The only SVOC detected in soil sample MD-S01-051010 was bis(2-ethylhexyl)phthalate at 2.7 mg/kg. This result does not exceed the U.S. EPA RSL.

4.3 BULK SAMPLE ANALYTICAL RESULTS

Table 4-3 summarizes the bulk insulation sample analytical results for asbestos (samples MD-BULK01-051010 and MD-BULK02-051010). Results for both samples were non-detect for asbestos and were shown to contain 99 percent glass.

4.4 SURFACE WATER SAMPLE ANALYTICAL RESULTS

Table 4-4 summarizes the analytical results for surface water sample MD-W01-051010, a composite of water in rain puddles next to the non-containerized pool chemicals. This sample was analyzed for chlorine, chloride, ammonia (as nitrogen), and pH. This composite sample contained 0.029 percent chlorine, 12 mg/L chloride, and 3.7 mg/L ammonia (as nitrogen). This sample had a laboratory pH result of 9.9 SUs. One of the puddles from which the composite sample was collected had a pH reading of 11 SUs when tested with pH paper during the site reconnaissance.

5. THREATS TO HUMAN HEALTH AND THE ENVIRONMENT

Factors to be considered in determining the appropriateness of a potential removal action at a Site are delineated in the NCP at 40 CFR 300.415(b)(2). A summary of the factors applicable to this Site are presented below.

- **Actual or potential exposure of nearby human populations, animals, or the food chain to hazardous substances or pollutants or contaminants**

  The northeast portion of the Site contains white solid chunks of material lying on the ground that are believed to be pool chemicals. Field testing using pH paper of a rain puddle near these chemicals indicated a pH of 11 SUs, which indicates that the pool chemicals are leaching to soil. In addition, numerous other suspected pool chemicals were observed in 55-gallon poly drums open to the atmosphere. Bags labeled "Ammonium Sulfate" also were present on site, and a sample collected from one of the bags contained 2,800 mg/kg of ammonia (as nitrogen). Ammonium sulfate has a median lethal dose (LD_{50}) of 2,840 mg/kg for rats. In addition, if the ammonium sulfate were to reach the Calumet Union Ditch, it could be potentially fatal to aquatic life. If the sodium tripoly phosphate were to reach the

Calumet Union Ditch, this could result in excessive nutrient (phosphate) loading which would be harmful to aquatic life.

The Site is located in a mixed commercial, industrial, and residential area. A church is located on site, and dogs live on the property. Although vehicle traffic cannot enter the Site at this time, access by foot is unrestricted. The potential exists for nearby human populations and animals to come in contact with these chemicals.

- **Hazardous substances, pollutants, or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release**

  The Site contains poly drums full of suspected pool chemicals, bags labeled "Ammonium Sulfate," totes containing oil, and numerous other drums and small containers. Sample MD-C04-051010 from one of the drums had a pH of 12 SUs which is just under the RCRA corrosivity characteristic limit of 12.5 SUs. Sample MD-C01-051010 from the suspected pool chemicals contained 4.5 percent chlorine and had a pH of 9.4 SUs. Also, the northeast portion of the Site contains un-containerized white solid chunks lying on the ground. Field testing using pH paper and analysis of a sample from the rain puddles near the chemicals indicate that the chemicals are leaching to soil. In addition, some drums were open to the atmosphere or tipped over.

- **Weather conditions that may cause hazardous substances, pollutants, or contaminants to migrate or be released**

  As mentioned above, rain has already caused the un-containerized chemicals to leach to soil, and analysis of a sample from the rain puddles near the chemicals indicate that the chemicals are leaching to soil. Because some of the drums and containers are open and chemicals are lying on the ground, materials could further be released through precipitation.

6. CONCLUSIONS

WESTON START conducted site reconnaissance and sample collection during the site assessment. A total of four waste, four soil, two bulk, and one surface water sample were collected. The two bulk samples consisted of insulation and were analyzed for asbestos. The results indicate that the insulation is 99 percent glass and do not contain asbestos. Based on the site observations and analytical results for the waste, soil and surface water samples, the hazards summarized below were identified at the Site.

- The following potentially hazardous materials and containers were observed at the Site:
  - White solid material lying on the ground and in 55-gallon poly drums suspected to contain pool chemicals (analytical results indicated a pH of 9.4 SUs and 4.5 percent chlorine for a sample from one of these drums);

- 2000-pound super sacks labeled "Sodium Tripoly Phosphate";
- 300-gallon totes partially filled with oil (analytical results revealed that the oil for a sample from one of these totes was non-flammable);
- Several 50-pound bags labeled "Ammonium Sulfate";
- One partially (one-quarter) full drum of "Pyrazol Yellow BG Powder" (analytical results revealed that a sample from this drum had a pH of 12 SUs);
- Several gas cylinders (suspected to be empty); and
- Thousands of empty containers including poly, steel, and fiberboard 55-gallon drums; 5-gallon poly containers; and miscellaneous small (1 quart or less) plastic containers.

• White solid material is leaching to soil during rain events as indicated by field testing for pH and based on sample analytical results.

FIGURES

TABLES

APPENDIX A
PHOTOGRAPHIC DOCUMENTATION

APPENDIX B
LABORATORY ANALYTICAL AND DATA VALIDATION REPORTS